Nageen Group of Schools

381 W.K Road Below HDFC Bank Meerut-250001

Test / Exam Name: Math's Chapter 12 Case Study. **Standard: 10th** **Subject: Mathematics**

Student Name: ---------- **Section:** ---------- **Roll No.:** ----------

Questions: 46 **Time: 01:30 hh:mm** **Marks: 230**

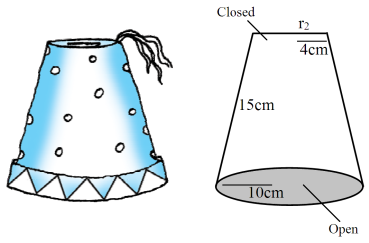
Instructions

1. Attempt all questions.

Q1. Mathematics teacher of a school took her 10th standard students to show Red fort. It was a part of their educational trip. The teacher had interest in history as well. She narrated the facts of Red fort to students. Then the teacher said in this monument one can find a combination of solid figures. There are 2 pillars which are cylindrical in shape. Also 2 domes at the corners which are hemispherical. 7 smaller domes at the centre. Flag hoisting ceremony on Independence Day takes place near these domes. **5 Marks**

1. How much cloth material will be required to cover 2 big domes each of radius of 2.5 meters? $(\text{Take } \pi = \frac{22}{7})$
1. 75m^2
2. 78.57m^2
3. 87.47m^2
4. 25.8m^2
2. Write the formula to find the volume of a cylindrical pillar.
1. $\pi r^2 h$
2. $\pi r l$
3. $\pi r(l+r)$
4. $2\pi r$
3. Find the lateral surface area of two pillars if the height of the pillar is 7m and the radius of the base is 1.4m.
1. 112.3cm^2
2. 123.2m^2
3. 90m^2
4. 345.2cm^2
4. How much is the volume of a hemisphere if the radius of the base is 3.5m?
1. 85.9m^3
2. 80m^3
3. 98m^3
4. 89.83m^3
5. What is the ratio of the sum of volumes of two hemispheres of radius 1cm each to the volume of a sphere of radius 2cm?
1. 1 : 1
2. 1 : 8
3. 8 : 1
4. 1 : 16

Q2. During the battle of Turks against the Rajputs of India, the Turk soldiers wore a costume with a metallic shield-like knee pads, buckler (elbow shield) and cap to save themselves from injuries. The headgear cap (a fez) used by these soldiers is shaped like the frustum of a cone with its radius on the open side 10cm, and radius at the upper base as 4cm and its slant height as 15cm. **5 Marks**



By using the above information, find the following:

1. The curved surface area of the cap is:

1. 650 cm^2
2. 660 cm^2
3. 606 cm^2
4. 666 cm^2

2. Area of the closed base is:

1. 55.285
2. 50.285
3. 52.285
4. 56.285

3. The area of the material used for making it.

1. 701.28cm^2
2. 720.28cm^2
3. 710.28cm^2
4. 717.28cm^2

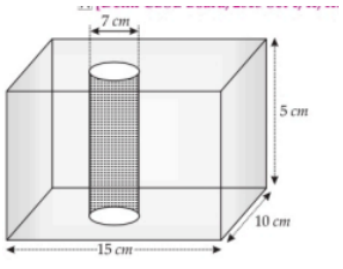
4. During the conversion of a solid from one shape to another the volume of the new shape will:

1. Increase
2. Remain unaltered
3. Double
4. Decrease

5. The formula to find the volume of the frustum of a cone is:

1. $\frac{2}{3}\pi h(r_1^2 + r_2^2 + r_1 r_2)$
2. $\frac{1}{3}\pi h(r_1^2 + r_2^2)$
3. $\frac{1}{3}\pi h(r_1^3 + r_2^3 + r_1 r_2)$
4. $\frac{1}{3}\pi h(r_1^2 + r_2^2 + r_1 r_2)$

Q3. **5 Marks**



In fig, from a cuboidal solid metallic block of dimensions 15cm × 10cm × 5cm, a cylindrical hole of diameter 7cm is drilled out. Find.

1. TSA of cuboidal block.

1. 550cm^2
2. 77cm^2
3. 110cm^2
4. 583cm^2

2. Volume of cuboid.

1. lbh
2. 2(lbh)
3. 2(lb + bh + hl)
4. None of these

3. CSA of cylinder.

1. 550cm^2
2. 77cm^2
3. 110cm^2
4. 583cm^2

4. Area of two circular bases.

1. 550cm^2
2. 77cm^2
3. 110cm^2
4. 583cm^2

5. Surface area of remainning block.

1. 550cm^2
2. 77cm^2
3. 110cm^2
4. 583cm^2

Q4.  **5 Marks**

A wooden maker makes wood designs into different kinds of shapes. He made a table with dimensions of 500cm × 300cm × 50cm. The leg is 50cm × 50cm × 200cm.

1. What is the total surface area?

1. 3892500cm^2
2. 7500000cm^3
3. 430000cm^2
4. 380000cm^3

2. What is the total surface area of 4 legs?

1. 45000cm^2
2. 7500000cm^3
3. 430000cm^2
4. 380000cm^3

3. What is the volume of table top?

1. 50000cm^2
2. 7500000cm^3
3. 430000cm^2
4. 380000cm^3

4. What is the total surface area of table top?

1. 50000cm^2
2. 8000000cm^3
3. 380000cm^3
4. 380000cm^3

5. What is the total volume of table?

1. 50000cm^2
2. 8000000cm^3
3. 380000cm^3
4. 380000cm^3

Q5. To make the teaching, learning process easier, creative, and innovative, A teacher brings clay in the classroom to teach the topic mensuration. She thought this method of teaching is more interesting, leave a long-lasting impact She forms a cylinder of radius 6cm and height 8cm with the clay, then she moulds the cylinder into a sphere and asks some question to students $[\text{use } \pi = 3.14]$ **5 Marks**

1. The radius of the sphere so form:

1. 6cm
2. 7cm
3. 4cm
4. 8cm

2. The volume of the sphere so formed:

1. 902.32cm^3
2. 899.34cm^3
3. 904.32cm^3
4. 999.33cm^3

3. What is the ratio of the volume of a sphere to the volume of a cylinder?

1. 1 : 2
2. 2 : 1

3. 1 : 1
4. 3 : 1

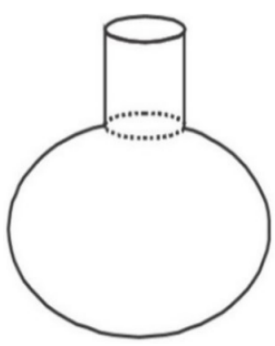
4. The total surface area of the cylinder is:

1. 525.57cm^2
2. 557.55cm^2
3. 534.32cm^2
4. 527.52cm^2

5. During the conversion of a solid from one shape to another the volume of the new shape will:

1. Increase.
2. Decrease.
3. Remain unaltered.
4. Be double.

Q6. **5 Marks**



In a house a water beaker is used. It is in the shape as shown in figure.

1. What is the volume of sphere when its radius is 15cm?

1. 14137.17cm^3
2. 1413.17cm^3
3. 13215.17cm^3
4. 12154.385cm^3

2. What is the volume of cylinder when its radius is 2cm and height is 5cm?

1. 62183cm^3
2. 62.83cm^3
3. 62cm^3
4. 63.28cm^3

3. What is the total volume of the cylinder?

1. 14218cm^3
2. 14356cm^3
3. 14200cm^3
4. 13280cm^3

4. What is the total volume when sphere radius is 10cm?

1. 4250cm^3
2. 4315.21cm^3
3. 4653.21cm^3
4. 4251.62cm^3

5. What is the volume of sphere when its radius is 10cm?

1. 4188.79cm^3
2. 4256.32cm^3
3. 4125.36cm^3
4. 3925.58cm^3

Q7. **5 Marks**

In a house tank water is filled completely. The tank is in cylindrical in shape with radius of 2m and height of 3m. In the morning the tank is full.

1. What is the volume of water in the morning?

1. 28.27m^3
2. 1.26m^3
3. 37.7m^3

4. $28.27m^3$

2. What is the volume of water when quarter of tank is emptied?

1. $1.26m^3$
2. $28.27m^3$
3. $37.7m^3$
4. $28.27m^3$

3. What is the volume of water when half of tank is emptied?

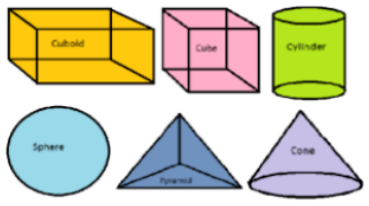
1. $28.27m^3$
2. $18.85m^3$
3. $37.7m^3$
4. $28.27m^3$

4. What is the volume of water when quarter of tank is remained with water?

1. $28.27m^3$
2. $12.57m^3$
3. $37.7m^3$
4. $9.43m^3$

5. What is the remaining volume when water is upto a height of 10cm?

1. $28.27m^3$
2. $12.57m^3$
3. $37.7m^3$
4. $1.26m^3$

Q8. 

5 Marks

A teacher in her class placed different shapes on her table. She is teaching her students by placing one over another.

1. She placed cube on cuboid. Cube is and cuboid is 5cm × 2cm × 1cm. What is the total surface of combination?

1. $25cm^2$
2. $40cm^2$
3. $38cm^2$
4. $42cm^2$

2. She placed cube on sphere which has 3cm radius. What is the total surface area?

1. $35cm^2$
2. $40cm^2$
3. $34.27cm^2$
4. $28.421cm^2$

3. She placed pyramid which has on cube. What is the total surface area?

1. $11.12cm^2$
2. $6.12cm^2$
3. $10cm^2$
4. $11cm^2$

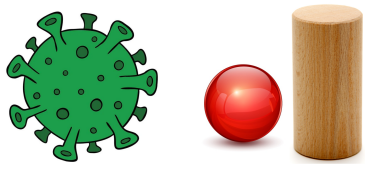
4. She placed cube over cuboid and sphere on cube. What is the total surface area?

1. $68.27cm^2$
2. $68.12cm^2$
3. $70cm^2$
4. $62cm^2$

5. She placed cube over cuboid and pyramid on cube. What is the total surface area?

1. $45.81cm^2$
2. $45.12cm^2$
3. $45cm^2$
4. $40cm^2$

Q9. Arun a 10^{th} standard student makes a project on corona virus in science for an exhibition in his school. **5 Marks**
In this project, he picks a sphere which has volume $38808cm^3$ and 11 cylindrical shapes, each of volume $1540cm^3$ with length 10cm.



Based on the above information, answer the following questions.

1. Diameter of the base of the cylinder is:
1. 7cm
2. 14cm
3. 12cm
4. 16cm
2. Diameter of the sphere is:
1. 40cm
2. 42cm
3. 21cm
4. 20cm
3. Total volume of the shape formed is:
1. 85541cm^3
2. 45738cm^3
3. 24625cm^3
4. 55748cm^3
4. Curved surface area of the one cylindrical shape is:
1. 850cm^2
2. 221cm^2
3. 440cm^2
4. 540cm^2
5. Total area covered by cylindrical shapes on the surface of sphere is:
1. 1694cm^2
2. 1580cm^2
3. 1896cm^2
4. 1740cm^2

Q10. The radii of two right circular cylinders are in the ratio of 2 : 3 andtheir heights are in the ratio of 5 : 4. **5 Marks**

1. Find the ratio of thier diameter.
1. 1:2
2. 2:3
3. 3:4
4. 1:3
2. Find the ratio of thier curved surface area.
1. 5:6
2. 3:4
3. 5:7
4. 3:5
3. Find the ratio of thier volume.
1. 3:7
2. 5:7
3. 7:9
4. 5:9

Q11. **5 Marks**

In a rectangular bucket of dimensions 100cm × 20cm × 50cm. It is kept under a tap for filling water.

1. After some time, the water filled upto height of 5cm. What is the total volume of water?
1. 10000cm^3

2. 60000cm^3
3. 20000cm^3
4. 40000cm^3

2. After some time, the water filled upto height of 10cm. What is the total volume of water?

1. 10000cm^3
2. 60000cm^3
3. 20000cm^3
4. 40000cm^3

3. After some time, the water filled upto height of 20cm. What is the total volume of water?

1. 10000cm^3
2. 60000cm^3
3. 20000cm^3
4. 40000cm^3

4. After some time, the water filled upto height of 30cm. What is the total volume of water?

1. 10000cm^3
2. 60000cm^3
3. 20000cm^3
4. 90000cm^3

5. After some time, the water filled upto height of 45cm. What is the total volume of water?

1. 10000cm^3
2. 40000cm^3
3. 20000cm^3
4. 90000cm^3

Q12. A solid is consisting of a right circular cone of height 120cm and radius 60cm standing on a hemisphere of radius 60cm. It is placed upright in a right circular cylinder full of water such that it touches the bottom. If the radius of the cylinder is 60cm and its height is 180cm. Find. **5 Marks**

1. Volume of cone.

1. 452160cm^3
2. 2034720cm^3
3. 904320cm^3
4. 1130400cm^3

2. Volume of hemishpere.

1. 452161cm^3
2. 2034720cm^3
3. 904320cm^3
4. 1130400cm^3

3. Total volume.

1. 452162cm^3
2. 2034720cm^3
3. 904320cm^3
4. 1130400cm^3

4. Volume of water in the cylinder.

1. 452163cm^3
2. 2034720cm^3
3. 904320cm^3
4. 1130400cm^3

5. Water left in the cylinder.

1. 452164cm^3
2. 2034720cm^3
3. 904320cm^3
4. 904320cm^3

Q13. Ajay is a Class X student. His class teacher Mrs Kiran arranged a historical trip to great Stupa of Sanchi. She explained that Stupa of Sanchi is great example of architecture in India. Its base part is cylindrical in shape. The dome of this stupa is hemispherical in shape, known as Anda. lt also contains a cubical shape part called Hermika at the top. Path around Anda is known as Pradakshina Path. **5 Marks**

Based on the above information, answer the following questions.

1. Find the lateral surface area of the Hermika, if the side of cubical part is 8m.

1. $128m^2$
2. $256m^2$
3. $512m^2$
4. $1024m^2$

2. The diameter and height of the cylindrical base part are respectively 42m and 12m. If the volume of each brick used is $0.01m^3$, then find the number of bricks used to make the cylindrical base.

1. 1663200
2. 1580500
3. 1765000
4. 8065000

3. If the diameter of the Anda is 42m, then the volume of the Anda is:

1. $17475m^3$
2. $18605m^3$
3. $19404m^3$
4. $18650m^3$

4. The radius of the Pradakshina path is 25m. If Buddhist priest walks 14 rounds on this path, then find the distance covered by the priest.

1. 1850m
2. 3600m
3. 2400m
4. 2200m

5. The curved surface area of the Anda is:

1. $2856m^2$
2. $2772m^2$
3. $2473m^2$
4. $2652m^2$

Q14.  **5 Marks**

In a sweet shop, the sweet maker made sweet in a tray. The tray size is 100cm × 50cm. He decided to cut the sweets as shown in figure. He cut 10 parts in length and breadth. The height of sweet is 5cm

1. What is the volume of each sweet part?

1. $325cm^3$
2. $275cm^3$
3. $300cm^3$
4. $250cm^3$

2. What is the volume of sweets of a single row in 100cm length?

1. $3000cm^3$
2. $250cm^3$
3. $2500cm^3$
4. $2700cm^3$

3. What is the volume of sweets of a single column in 50cm width?

1. $12525cm^3$
2. $2500cm^3$
3. $153500cm^3$
4. $32500cm^3$

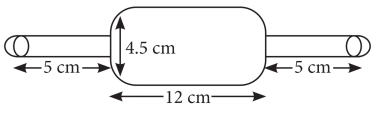
4. What is the volume of sweets when all edges of sweets are removed?

1. $6000cm^3$
2. $8000cm^3$
3. $12000cm^3$

4. 10000cm^3
5. What is the volume for 4 sweets in a length 100cm?

1. 1000cm^3
2. 800cm^3
3. 600cm^3
4. 1200cm^3

Q15. Arp an a is studying in X standard. While helping her mother in kitchen, she saw rolling pin made of steel and empty from inner side, with two small hemispherical ends as shown in the figure. **5 Marks**



1. Find the curved surface area of two identical cylindrical parts, if the diameter is 2.5cm and length of each part is 5cm.

1. 475cm^2
2. 78.57cm^2
3. 877cm^2
4. 259.19cm^2

2. Find the volume of big cylindrical part.

1. 190.93cm^3
2. 75cm^3
3. 77cm^3
4. 83.5cm^3

3. Volume of two hemispherical ends having diameter 2.5cm, is:

1. 4.75cm^3
2. 8.18cm^3
3. 2.76cm^3
4. 75cm^3

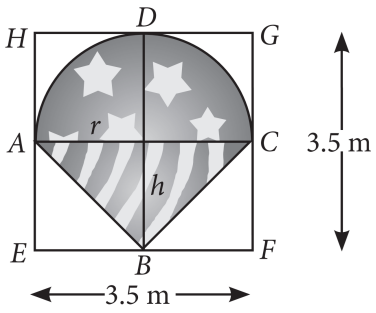
4. Curved surface area of two hemispherical ends, is:

1. 17.5cm^2
2. 7.9cm^2
3. 19.64cm^2
4. 15.5cm^2

5. Find the difference of volumes of bigger cylindrical part and total volume of the two small hemispherical ends.

1. 175.50cm^3
2. 182.75cm^3
3. 76.85cm^3
4. 96cm^3

Q16. Emily purchased a spinner from a shop, which is of the shape as shown in the figure, in which right circular cone and hemisphere lie on opposite sides of a common base of length 3.5m. Cylindrical box circumscribing them in this position. **5 Marks**



Now, answer the following questions.

1. What will be the volume of the cone?

1. 6.5m^3
2. 2.9m^3
3. 40m^3
4. 5.614m^3

2. Volume of hemispherical part is:

1. 11.23m^3
2. 6.03m^3
3. 8m^3
4. 9.5m^3

3. Volume of cylinder that circumscribe the cone and hemisphere, is:

1. $31m^3$
2. $17.19m^3$
3. $17.5m^3$
4. $33.69m^3$

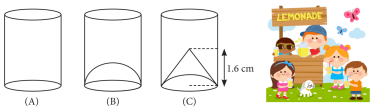
4. Find the additional space enclosed by the cylinder.

1. $3.14m^3$
2. $0.13m^3$
3. $2.14m^3$
4. $16.846m^3$

5. Find the ratio of the curved surface areas of cone and hemisphere.

1. $1 : \sqrt{2}$
2. $1 : 3$
3. $1 : \sqrt{5}$
4. $1 : 5$

Q17. Pinki's class teacher explained the students about the benefits of drinking fruit juice in the morning. So, Pinki went to a juice stall with her friend Bipin. On the stall, they observed that shopkeeper has three types of glasses of inner diameter 4.6cm to serve customers. The height of each glass is 11cm. Seeing this, certain questions came into their mind. Help Pinki and Bipin to solve these questions. **5 Marks**



Based on the above information, answer the following questions.

1. Volume of the type (A) glass is:

1. $275.6cm^3$
2. $250.6cm^3$
3. $182.88cm^3$
4. $208cm^3$

2. Volume of type (Bl glass is:

1. $208.6cm^3$
2. $150.5cm^3$
3. $152.4cm^3$
4. $157.39cm^3$

3. How much more juice can be filled in type (A) glass than glass of type (C)?

1. 10.48mL
2. 9.10mL
3. 98.12mL
4. 8.6mL

4. Which glass has minimum capacity?

1. Type (A)
2. Type (B)
3. Type (C)
4. All glasses have same capacity.

5. Which mathematical concept has been used in above problem?

1. Curved surface area.
2. Total surface area.
3. Volume.
4. None of these.

Q18. A wooden article was made by scooping out a hemisphere from each end of a solid cylinder. If the height of the cylinder is 10cm and its base is of radius 3.5cm. **5 Marks**

1. Find CSA of cylinder.

1. $110cm^2$
2. $220cm^2$
3. $330cm^2$
4. $440cm^2$

2. Find the surface area of two hemispherical scopes.

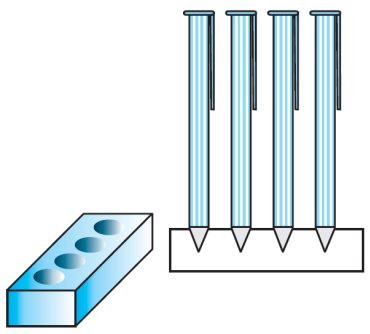
1. $160cm^2$
2. $150cm^2$

3. $154cm^2$
4. $170cm^2$

3. Find total surface area of the article.

1. $270cm^2$
2. $370cm^2$
3. $374cm^2$
4. $410cm^2$

Q19. A carpenter used to make and sell different kinds of wooden pen stands like rectangular, cuboidal, cylindrical, conical. Aarav went to his shop and asked him to make a pen stand as explained below. Pen stand must be of the cuboidal shape with three conical depressions, which can hold 3 pens. The dimensions of the cuboidal part must be 20cm × 15cm × 5cm and the radius and depth of each conical depression must be 0.6cm and 2.1cm respectively. Based on the above information, answer the following questions. **5 Marks**



1. The volume of the cuboidal part is:

1. $1250cm^3$
2. $1500cm^3$
3. $1625cm^3$
4. $1500cm^3$

2. Total volume of conical depressions is:

1. $2.508cm^3$
2. $1.5cm^3$
3. $2.376cm^3$
4. $3.6cm^3$

3. Volume of the wood used in the entire stand is:

1. $631.31cm^3$
2. $3564cm^3$
3. $1502.376cm^3$
4. $1497.624cm^3$

4. Total surface area of cone of radius r is given by,

1. $\pi rl + \pi r^2$
2. $2\pi rl + \pi r^2$
3. $\pi r^2 l + \pi r^2$
4. $\pi rl + 2\pi r^3$

5. If the cost of wood used is ₹ 5 per cm^3, then the total cost of making the pen stand is:

1. ₹ 8450.50
2. ₹ 7480
3. ₹ 9962.14
4. ₹ 7488.12

Q20. **5 Marks**

A group of people went to a trip and decided to rest under a tent. They made a tent to take shelter as shown in figure. Group decided to make tent with triangle dimensions as follows. Base 6m, length as 4m and height as 4m.

1. What is the total volume?

1. $48m^3$
2. $64m^3$
3. $72m^3$
4. $124m^3$

2. Since the volume 48m^3 is insufficient for them. The group decided to increase the length upto 6m.
   What is the total volume now?

1. 48m^3
2. 64m^3
3. 72m^3
4. 124m^3

3. What is the total volume when base is increased upto 9m?

1. 39.23m^3
2. 58.85m^3
3. 62.35m^3
4. 72m^3

4. What is the total volume when length is increased upto 6m and base is decreased upto 4m?

1. 42m^3
2. 42m^3
3. 64m^3
4. 55m^3

5. What is the value of base if the total volume is 42.93m^3 ?

1. 2 m
2. 6 m
3. 4 m
4. 3 m

Q21. Rahul was at a restaurant and he ordered a place of rice there. The rice was plated in a form of heap. **5 Marks**

The heap of rice is in the form of a cone of base diameter 24m and height 3.5m.

1. Find the radius

1. 24m
2. 12m
3. 6m
4. 8m

2. Find the volume of rice.

1. 528m^3
2. 520m^3
3. 427m^3
4. 428m^3

3. How much canvas cloth is required to just cover the heap ?

1. 470.4m^3
2. 471.4m^3
3. 470m^3
4. 471m^3

Q22. **5 Marks**

A parent took his child to bakery. The child asked to his father to take chocolate donut. The donut is shown in the above figure.

1. The shop owner gave a plain donut to the child which has outer diameter of 9cm and inner diameter of 4cm. What is the total surface area?take $(\pi = 3.14)$

1. 113.04cm^2
2. 131.4m^2
3. 130cm^2
4. 113.4cm^2

2. The child asked the shop owner to give chocolate dipped donut. The chocolate has a thickness of 1mm. What is the total surface area now?

1. 132.4cm^2
2. 118.692cm^2
3. 314ccm^2
4. 143.96cm^2

3. The father took double chocolate donut. What is the total surface of his donut?

1. 132.4cm^2
2. 137.68m^2
3. 122.46cm^2
4. 124.344cm^2

4. The father took six donuts packed in a box. The box has a . What is the total surface area of box?

1. 1848cm^2
2. 1900cm^2
3. 1948cm^2
4. 1932cm^2

5. What is the total surface area when a gift wrapper is wrapped for 2 boxes? (one above another)?

1. 24488cm^2
2. 1900cm^2
3. 2460cm^2
4. 2470cm^2

Q23. A mathematics teacher took her grade X students to the Taj Mahal. It was an educational trip. She was interested in history also. On reaching there she told them about the history and facts about the seventh wonder. She also told them that the structure of the monument is a combination of several solid figures. There are 4 pillars that are cylindrical in shape. A big dome in the center and 2 more small domes on both sides of the big dome on its side. The domes are hemispherical. The pillars also have domes on them. **5 Marks**

1. How much cloth material will be required to cover a big dome of a diameter of 7m?

1. 77 m^2
2. 78 m^2
3. 79 m^2
4. 80 m^2

2. Write the formula to calculate the volume of the pillar.

1. $\pi r^2 h + \pi r^3$
2. $\pi r^2 h + \frac{2}{3}\pi r^2 l$
3. $\pi r l + \frac{2}{3}\pi r^3$
4. $\pi r^2 h + \frac{2}{3}\pi r^3$

3. How much is the volume of the hemisphere if the radius of the base is 3m?

1. 65.57m^3
2. 75.77m^3
3. 56.57m^3
4. 85.57m^3

4. Find the curved surface area of 4 pillars if the height of pillars is 7.5m and the radius of the base is 2.5m.

1. 768.56 m^2
2. 658.56 m^2
3. 766.56 m^2
4. 628.57 m^2

5. What is the ratio of the sum of volumes of two-cylinder of radius 1 cm and height 2 cm each to the volume of a sphere of radius 3cm?

1. 2 : 3
2. 3 : 2
3. 1 : 1
4. 1 : 2

Q24. Due to heavy floods in a state, thousands of people were homeless. 50 schools collectively offered to the state government to provide the place and the canvas for 1500 tent to be fixed by the government and decided to share the whole expenditure equally. The lower part of each tent is cylindrical of base radius 2.8m and height 3.5m, with the conical upper part of the same base radius but of height 2.1m. $(\text{use } \pi = \frac{22}{7})$ **5 Marks**

1. Area of canvas used to make the tent is:
1. TSA of cylindrical portion + CSA of the conical portion
2. CSA of cylindrical portion + CSA of the conical portion
3. CSA of cylindrical portion + TSA of the conical portion
4. TSA of cylindrical portion + TSA of the conical portion
2. The volume of the tent is:
1. $\pi r^2(\frac{1}{3}r + h)$ cubic units
2. $\frac{1}{3}\pi r^2(r+h)$ cubic units
3. $\frac{4}{3}\pi r^2 h$ cubic units
4. None of these
3. If the canvas used to make the tent cost ₹120 per sq.m, find the amount to be paid by the schools for making the tents.
1. ₹ 11098
2. ₹ 88889
3. ₹ 11088
4. ₹ 99998
4. Amount shared by each school to set-up the tents.
1. ₹ 442640
2. ₹ 222640
3. ₹ 332640
4. ₹ 552640
5. According to the given information, what is the ratio of the curved surface area of the cylindrical portion to the conical portion:
1. 1 : 2
2. 2 : 3
3. 4 : 1
4. 2 : 1

Q25. To promote cooperation, culture, creativity, sharing, self-confidence, and other social values, a student adventure camp was organized by the school for X-class students and their accommodation was planned in texts. The teacher divides the students into groups, each group of four students was given to prepare a conical tent of radius 7m and canvas of area 551m^2 in which 1m^2 is used in stitching and wasting of canvas: **5 Marks**

1. Curved surface of conical tent:
1. πrl
2. $\pi r^2 h$
3. $\frac{1}{3}\pi rl$
4. $2\pi r(r+l)$
2. Height of the conical tent:
1. 23m
2. 24m

3. 25m
4. 26m

3. Volume of tent:

1. 1234m^3
2. 1232m^3
3. 1332m^3
4. 1343m^3

4. How much space is occupied by each student in the tent?

1. 318m^3
2. 813m^3
3. 308m^3
4. 391m^3

5. The cost of canvas required for making the tent, if the canvas cost ₹ 70 per sq. m.

1. ₹ 40,000
2. ₹ 38570
3. ₹ 38575
4. ₹ 48470

Q26. **5 Marks**

A student performing a test using using test tube in a chemistry lab. The test tube is shown in the above figure.

1. What shapes are found in a test tube?
   1. Cylinder
   2. Hemisphere
   3. Both A and B
   4. None of the above
2. What is the surface area of cylinder when radius is 1cm and total height is 12cm? take $(\pi = 3.14)$.

1. 60cm^2
2. 75.36cm^2
3. 72.21cm^2
4. 75cm^2

3. What is the surface area of hemisphere?

1. 11.23cm^2
2. 10.4cm^2
3. 8.81cm^2
4. 6.28cm^2

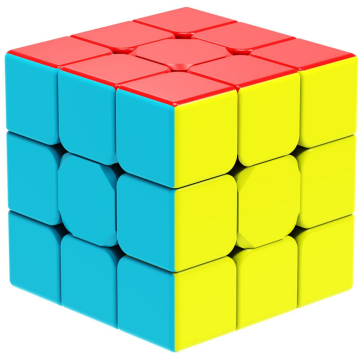
4. What is the total surface area?

1. 373cm^2
2. 81.64cm^2
3. 75.21cm^2
4. 76.4cm^2

5. What is the total surface area when two test tubes are placed together which becomes like a tablet?

1. 157cm^2
2. 166cm^2
3. 17cm^2
4. 170.451cm^2

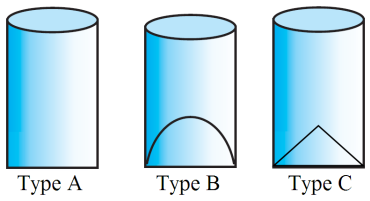
Q27. **5 Marks**



A teacher in his class brought a Rubix cube as shown in the figure. He wanted to explain surfaces and volumes of the Rubix cube. He explained that the Rubix cube is a combination of smaller cubes. It contains cubes in 3 × 3 × 3 manner. Each cube has 2cm × 2cm × 2cm.

1. What is the total surface area of Rubix cube?
1. 216cm^2
2. 108cm^2
3. 124cm^2
4. 132cm^2
2. What is the surface area when only 9 cubes are considered(3 × 3 × 1)?
1. 216cm^2
2. 108cm^2
3. 120cm^2
4. 132cm^2
3. What is the curved surface area of each cube?
1. 26cm^2
2. 8cm^2
3. 12cm^2
4. 16cm^2
4. What is the total surface area when four Rubix cubes are joined in a row?
1. 1200cm^2
2. 642cm^2
3. 420cm^2
4. 800cm^2
5. What is the total surface area when 1 cube is removed from corner?
1. 210cm^2
2. 192cm^2
3. 150cm^2
4. 132cm^2

Q28. Ganesh a juice seller has his juice shop near Qutub Minar in Delhi. He has three types of glasses, Type A - A glass with a plane bottom, Type B - A glass with a hemispherical raised bottom, and Type C - A glass with the conical raised bottom of height 1.5 cm. The inner diameter of all types of glass is the same as 5cm to serve the customer. The height of the glasses is 10cm $(\text{use } \pi = 3.14)$ **5 Marks**



1. The volume of the glass of type A:
1. 196.25cm^3
2. 169.52cm^3
3. 187.25cm^3
4. 172.55cm^3
2. The volume of the hemisphere in the glass of type B:
1. 37.71cm^3
2. 32.71cm^3
3. 33.71cm^3
4. 43.34cm^3
3. The volume of a glass of type B:
1. 136.54cm^3
2. 166.45cm^3
3. 163.54cm^3
4. 176.54cm^3

4. The volume of the cone in the glass of type C:

1. $8.33cm^3$
2. $9.81cm^3$
3. $10.81cm^3$
4. $11.88cm^3$

5. The volume of a glass of type C:

1. $188.88cm^3$
2. $189.99cm^3$
3. $196.89cm^3$
4. $186.44cm^3$

Q29. Meera and Dhara have 12 and 8 coins respectively each of radius 3.5cm and thickness 0.5cm. They place their coins one above the other to form solid cylinders. **5 Marks**

Based on the above information, answer the following questions.

1. Curved surface area of the cylinder made by Meera is:

1. $144cm^2$
2. $132cm^2$
3. $154cm^2$
4. $142cm^2$

2. The ratio of curved surface area of the cylinders made by Meera and Dhara is:

1. 2 : 5
2. 3 : 2
3. 1 : 2
4. 2 : 7

3. The volume of the cylinder made by Dhara is:

1. $154cm^3$
2. $144cm^3$
3. $132cm^3$
4. $142cm^3$

4. The ratio of the volume of the cylinders made by Meera and Dhara is:

1. 1 : 2
2. 2 : 5
3. 3 : 2
4. 4 : 3

5. When two coins are shifted from Meera's cylinder to Dharas cylinder, then,

1. Volume of two cylinder become equal.
2. Volume of Meera's cylinder> Volume of Dhara's cylinder.
3. Volume of Dhara's cylinder> Volume of Meera's cylinder.
4. None of these.

Q30. Pankaj's father has to purchase a new water tank to store water for irrigation of their fields. For this purpose, they visit to a shop. The shopkeeper has three types of water tanks as shown below. **5 Marks**

Based on the above information, answer the following questions.

1. If the radius of type-I tank is 1.5m and its height is 3.5m, then find the capacity of tank type-I. $[\text{Take } \pi = 3.14]$

1. 24727.5 litres
2. 10000 litres
3. 13200 litres

4. 90400 litres

2. Find the capacity of type-II tank having dimensions 5m × 4m × 3.5m.

1. 72000 litres
2. 70000 litres
3. 250000 litres
4. 404000 litres

3. How much more water type-III tank con ta ins than tank of type- I, if its base radius is 2.5m and total height is 5.5m? $[\text{Take } \pi = 3.14]$

1. 12394.5 litres
2. 32200.5 litres
3. 29000.5 litres
4. 66852.5 litres

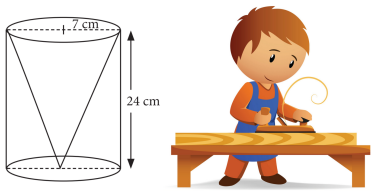
4. If Pankaj's father bought type-II tank and wants to cover it with a cloth costs t 45 per m^2, then find the total cost of cloth used (if cloth is covered on all its faces).

1. ₹ 4495
2. ₹ 1500
3. ₹ 4635
4. ₹ 1750

5. Find the ratio of the total surface area of type-I and type-II tanks.

1. 728 : 275
2. 275 : 729
3. 51 : 325
4. 471 : 1030

Q31. One day Rinku was going home from school, saw a carpenter working on wood. He found that he is carving out a cone of same height and same diameter from a cylinder. The height of the cylinder is 24cm and base radius is 7cm. While watching this, some questions came into Rinku's mind. Help Rinku to find the answer of the following questions. **5 Marks**



1. After carving out cone from the cylinder,

1. Volume of the cylindrical wood will decrease.
2. Height of the cylindrical wood will increase.
3. Volume of cylindrical wood will increase.
4. Radius of the cylindrical wood will decrease.

2. Find the slant height of the conical cavity so formed.

1. 28cm
2. 38cm
3. 35cm
4. 25cm

3. The curved surface area of the conical cavity so formed is:

1. 250cm^2
2. 550cm^2
3. 350cm^2
4. 450cm^2

4. External curved surface area of the cylinder is:

1. 876cm^2
2. 1250cm^2
3. 1056cm^2
4. 1025cm^2

5. Volume of conical cavity is:

1. 1232cm^3
2. 1248cm^3
3. 1380cm^3
4. 999cm^3

Q32. **5 Marks**

A candle is lighted when it is 10cm in height and diameter 4cm.

1. What is the volume of candle initially?

1. 125.66cm^3
2. 12.57cm^3
3. 62.83cm^3
4. 50.27cm^3

2. What is the volume when the height is decreased upto 9cm?

1. 125.66cm^3
2. 113.1cm^3
3. 62.83cm^3
4. 50.27cm^3

3. What is the volume when candle is decreased upto 5cm?

1. 125.66cm^3
2. 113.1cm^3
3. 62.83cm^3
4. 50.27cm^3

4. What is the volume when candle is decreased upto 4cm?

1. 125.66cm^3
2. 113.1cm^3
3. 12.57cm^3
4. 50.27cm^3

5. What is the volume when candle is decreased upto 1cm?

1. 125.66cm^3
2. 12.57cm^3
3. 62.83cm^3
4. 50.27cm^3

Q33. To make the learning process more interesting, creative and innovative, Amayras' class teacher brings clay in the classroom, to teach the topic-Surface Areas and Volumes. With clay, she forms a cylinder of radius 6cm and height 8cm. Then she moulds the cylinder into a sphere and asks some questions to students. **5 Marks**

1. The radius of the sphere so fanned is:

1. 4cm
2. 6cm
3. 7cm
4. 8cm

2. The volume of the sphere so formed is:

1. 905.14cm^3
2. 903.27cm^3
3. 1296.5cm^3
4. 1156.63cm^3

3. Find the ratio of the volume of sphere to the volume of cylinder.

1. 2 : 1
2. 1 : 2
3. 1 : 1
4. 3 : 1

4. Total surface area of the cylinder is:

1. 528cm^2
2. 756cm^2
3. 625cm^2
4. 636cm^2
5. During the conversion of a solid from one shape to another the volume of new shape will,

1. Be increase.
2. Be decrease.
3. Remain unaltered.
4. Be double.

Q34. Isha's father brought an ice-cream brick, empty cones and scoop to pour the ice-cream into cones for all the family members. Dimensions of the ice-cream brick are (30 × 25 × 10)cm? and radius of hemi-spherical scoop is 3.5cm. Also, the radius and height of cone are 3.5cm and 15cm respectively. **5 Marks**

Based on the above information, answer the following questions.

1. The quantity of ice-cream in the brick (in litres) is:

1. 3
2. 7.5
3. 2.5
4. 4.5

2. Volume of hemispherical scoop is:

1. 40.6cm^3
2. 2509cm^3
3. 89.83cm^3
4. 20cm^3

3. Volume of a cone is:

1. 148cm^3
2. 250.05cm^3
3. 145.83cm^3
4. 192.5cm^3

4. The minimum number of scoops required to fill one cone upto brim is:

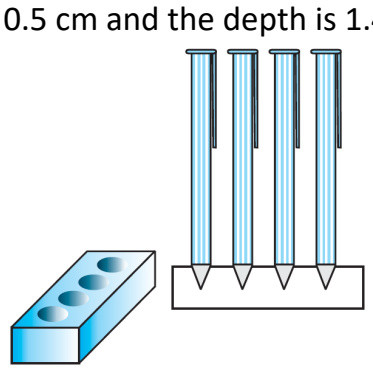
1. 2
2. 3
3. 4
4. 5

5. The number of cones that can be filled upto brim using the whole brick is:

1. 15
2. 39
3. 40
4. 42

Q35. carpenter in the small town of Bareilly used to make and sell different kinds of wood items like a rectangular box, cylindrical pen stand, and cuboidal pen stand. One day a student came to his shop and asked him to make a pen stand with the dimensions as follows: **5 Marks**

A pen stand should be in the shape of a cuboid with four conical depressions to hold pens. The dimensions of the cuboid should be 15cm by 10cm by 3.5cm. The radius of each of the depressions is 0.5 cm and the depth is 1.4cm.



By using the above-given information, find the following:

1. The volume of the cuboid is:

1. 552cm^3
2. 252cm^3

3. 525cm^3
4. 225cm^3

2. Volume of four conical depressions is:

1. $\frac{15}{22}\text{cm}^3$
2. $\frac{22}{15}\text{cm}^3$
3. $\frac{22}{30}\text{cm}^3$
4. $\frac{11}{30}\text{cm}^3$

3. The volume of wood in the entire stand is:

1. 523.53cm^3
2. 532.53cm^3
3. 325.53cm^3
4. 552.53cm^3

4. The formula of TSA of the cone is given by:

1. $2\pi\text{rl} + \pi\text{r}^2$
2. $\pi\text{r}^2\text{l} + \pi\text{r}^2$
3. $\pi\text{rl} + 2\pi\text{r}^2$
4. $\pi\text{rl} + \pi\text{r}^2$

5. During the conversion of a solid from one shape to another the volume of the new shape will:

1. Increase
2. Decrease
3. Remain unaltered
4. Be double

Q36. Ankit wants a beautiful ceramic cuboidal flower vase for the decoration of his room. So, he visit to ceramicists and explained him about, what kind of flower vase he wan ts. According to his requirement, the ceramicists carved out a sphere of maximum size from a cuboidal ceramic block of dimensions 24cm by 24cm by 27cm. **5 Marks**

Based on the above information, answer the following questions.

1. What is the maximum radius of the sphere that can be carved out from the block of ceramic?
1. 17cm
2. 23cm
3. 9cm
4. 12cm
2. What is the volume of the complete block of ceramic?
1. 15552cm^3
2. 12646cm^3
3. 15292cm^3
4. 12898cm^3
3. What is the volume of the ceramic carved out?
1. 1940.4cm^3
2. 7241.14cm^3
3. 14553.5cm^3
4. None of these.
4. What is the volume of the cuboidal vase thus formed?
1. 8853.73cm^3
2. 1153.37cm^3

3. 8310.86cm^3
4. None of these.
5. What is the surface area of the sphere carved out?
1. 15540cm^2
2. 1810.28cm^2
3. 2702cm^2
4. 1838cm^2

Q37. **5 Marks**

A child eating tobelrone choclate which is shown in figure. Dimensions of chocolate package is 3cm × 4cm × 6cm.

1. What is the total surface area of the package?
1. 180cm^2
2. 33cm^2
3. 66cm^2
4. 22.8cm^2
2. What is the total surface area of the package when it is cut into 5 equal parts in width?
1. 180cm^2
2. 33cm^2
3. 66cm^2
4. 22.8cm^2
3. What is the each surface area when chocolate is cut in half?
1. 180cm^2
2. 33cm^2
3. 66cm^2
4. 22.8cm^2
4. What is the total surface area when 6 chocolates are placed together to get a shape of hexagon?
1. 180cm^2
2. 33cm^2
3. 66cm^2
4. 22.8cm^2
5. What is the total surface area when 3 chocolates are combined?
1. 198cm^2
2. 33cm^2
3. 66cm^2
4. 22.8cm^2

Q38. **5 Marks**

Children are playing with dice which has a dimesion of each.

1. What is the surface area of one dice?
1. 6cm^2
2. 6.14cm^2
3. 7.2cm^2
4. 3cm^2
2. Children decided to play with two dice. A child placed one dice above another. What is the total surface area?
1. 12cm^2
2. 6.14cm^2
3. 7.2cm^2
4. 10cm^2
3. Another child placed 4 dices together to form a cube. What is total surface area?
1. 18cm^2

2. 6.14cm^2
3. 24cm^2
4. 10cm^2

4. Another child placed 4 dices one after another. What is the total surface area?

1. 18cm^2
2. 6.14cm^2
3. 24cm^2
4. 10cm^2

5. Another child placed 10 dices one after another. What is the total surface area?

1. 18cm^2
2. 42cm^2
3. 24cm^2
4. 60cm^2

Q39. Ritu packed a football as a gift for her brother's birthday in a cuboidal box whose diameter is same as that of length of base of the box having length, breadth and height respectively 23cm, 23cm and 28cm. **5 Marks**

1. The volume of the football is:

1. 8581cu.cm
2. 6373.19cu.cm
3. 6451cu.cm
4. 9807cu.cm

2. Ritu covers the box with a wrapping sheet. The area of the wrapping sheet that covers the box exactly is:

1. 3634sq.cm
2. 2533sq.cm
3. 2584sq.cm
4. 3813sq.cm

3. The volume of the box is:

1. 25733cu.cm
2. 18573cu.cm
3. 14812cu.cm
4. 77536cu.cm

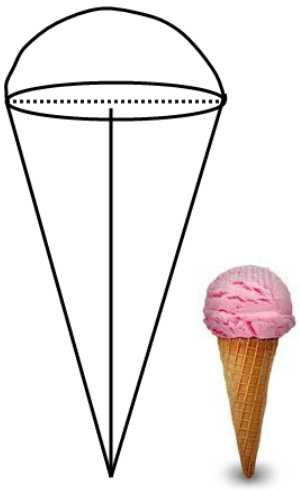
4. Half of the remaining volume of the box is filled with thermocol balls. Find the volume of thermocol balls used.

1. 36150.9cu.cm
2. 4219.405cu.cm
3. 2764cu.cm
4. 4048.05cu.cm

5. The surface area of the football is:

1. 691.03sq.cm
2. 12772sq.cm
3. 15544sq.cm
4. 1662.57sq.cm

Q40. An ice-cream seller used to sell different kinds and different shapes of ice-cream like rectangular shaped, conical shape with one end hemispherical, Rectangular shape with one end hemispherical and rectangular brick, etc. One day a child came to his shop and purchased an ice-cream which has the following shape: ice-cream cone as the union of a right circular cone and a hemisphere that has the same (circular) base as the cone. The height of the cone is 9cm and the radius of its base is 2.5cm. **5 Marks**



By reading the above-given information, find the following:

1. Volume of only hemispherical end of the icecream is:

1. $\frac{1357}{42}\mathrm{cm}^3$
2. $\frac{1375}{42}\mathrm{cm}^3$
3. $\frac{1575}{42}\mathrm{cm}^3$
4. $\frac{1373}{42}\mathrm{cm}^3$

2. The volume of the ice-cream without hemispherical end is:

1. $\frac{852}{14}\mathrm{cm}^3$
2. $\frac{852}{41}\mathrm{cm}^3$
3. $\frac{825}{41}\mathrm{cm}^3$
4. $\frac{825}{14}\mathrm{cm}^3$

3. The TSA of cone is given by:

1. $\pi\mathrm{rl} + 2\pi\mathrm{r}^2$
2. $\pi\mathrm{rl} + 2\pi\mathrm{r}$
3. $\pi\mathrm{rl} + \pi\mathrm{r}^2$
4. $2\pi\mathrm{rl} + \pi\mathrm{r}^2$

4. The volume of the whole ice-cream is:

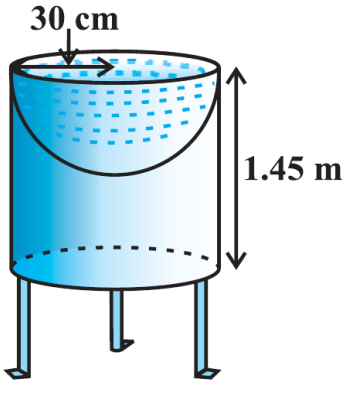
1. $91\frac{2}{3}\mathrm{cm}^3$
2. $91\frac{3}{2}\mathrm{cm}^3$
3. $19\frac{2}{3}\mathrm{cm}^3$
4. $91\frac{3}{2}\mathrm{cm}^3$

5. During the conversion of a solid from one shape to another the volume of the new shape will:

1. Increase
2. Decrease
3. Double
4. Remain unaltered

Q41. Study the figures and surfaces: **5 Marks**

Mayank a student of class 7th loves watching and playing with birds of different kinds. One day he had an idea in his mind to make a bird-bath on his garden. His brother who is studying in class 10th helped him to choose the material and shape of the birdbath. They made it in the shape of a cylinder with a hemispherical depression at one end as shown in the Figure below. They opted for the height of the hollow cylinder as 1.45m and its radius is 30cm.



By using the above-given information, find the following:

1. The curved surface area of the hemisphere is:
1. 0.36m^2
2. 0.46m^2
3. 0.26m^2
4. 0.56m^2
2. The curved surface area of the cylinder is:
1. $0.78\pi \ \mathrm{m}^2$
2. $\frac{0.87}{2}\pi \ \mathrm{m}^2$
3. $0.87\pi^2 \ \mathrm{m}^2$
4. $0.87\pi \ \mathrm{m}^2$
3. The total surface area of the bird-bath is: $(\mathrm{Take}\ \pi = \frac{22}{7})$

1. 2.3m^2
2. 3.3m^2
3. 3.5m^2
4. 5.3m^2
4. The Total surface area of the cylinder is given by:
1. $2\pi \times \mathrm{r} \times \mathrm{h} + 2\pi^3$
2. $2\pi \times \mathrm{r} \times \mathrm{h} + \pi\mathrm{r}^2$
3. $2\pi \times \mathrm{r} \times \mathrm{h} + 2\pi\mathrm{r}^2$
4. $\pi \times \mathrm{r} \times \mathrm{h} + 2\pi\mathrm{r}^2$
5. During the conversion of a solid from one shape to another the volume of the new shape will:
1. Remain unaltered
2. Decrease
3. Double
4. Increase

Q42.  **5 Marks**

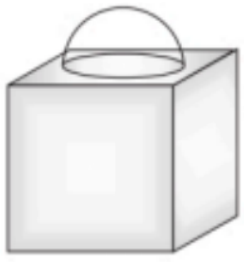
In the above figure, Taj Mahal is shown. Mathematics teacher of a school took her 10th standard students for a part of an educational trip, to show Taj Mahal. The teacher narrated the facts of Taj Mahal to students. The teacher said in this monument one can find a combination of solid figures.

1. The spike at top center is in the shape of cone. Its radius is 3cm and height is 150cm. What is the surface area?
1. 1442.27cm^2
2. 942m^2
3. 1281.77cm^2
4. 5127.07cm^2
2. The centre part at top is in the shape of hemisphere. It has dimensions of 10m radius. What is the surface area?
1. 1442.27cm^2
2. 628.57m^2
3. 37.68cm^2
4. 5127.07cm^2
3. The pillars are in cylindrical shape with a radius of 2m and height of 100m. What is the surface area?
1. 1442.27cm^2
2. 942m^2
3. 1257.14cm^2
4. 37.68cm^2
4. What is the surface area of 4 pillars?
1. 1442.27cm^2
2. 942m^2

3. 1281.77cm^2
4. 5028.57cm^2
5. Pillars contain hemispheres at top with a radius 2m. What is the surface area?

1. 25.14cm^2
2. 942m^2
3. 1281.77cm^2
4. 5127.07cm^2

Q43. **5 Marks**



The given figure is a decorative block, made up of two solids-a cube and a hemisphere. The base of the block is a cube ofside 6cm and the hemisphere fixed on the top has a diameter of 3.5cm.

1. Find TSA of cube.

1. 210cm^2
2. 196cm^2
3. 225cm^2
4. 216cm^2

2. Find TSA of hemisphere.

1. 19.25cm^2
2. 25cm^2
3. 11cm^2
4. 15.25cm^2

3. Find TSA of block.

1. 220.625cm^2
2. 200.650cm^2
3. 225.625cm^2
4. 225cm^2

Q44. Alok and his family went for a vacation to Jaipur. There they had a stay in tent for a night. Alok found that the tent in which they stayed is in the form of a cone surmounted on a cylinder. The total height of the tent is 42m, diameter of the base is 42m and height of the cylinder is 22m. **5 Marks**

Based on the above information, answer the following questions.

1. How much canvas is needed to make the tent?

1. 3280m^2
2. 4464m^2
3. 4818m^2
4. None of these

2. If each person needs 126m^2 of floor, then how many persons can be accommodated in the tent?

1. 17
2. 11
3. 19
4. 15

3. Find the cost of the canvas used to make the tent, if the cost of 100m^2 of canvas is ₹ 425.

1. ₹ 12944
2. ₹ 18244
3. ₹ 24724
4. ₹ 20476.50

4. Find the volume of the tent.

1. 27248m^3
2. 32496m^3
3. 39732m^3
4. 15874m^3
5. Find the number of persons that can be accommodated in tent, if each person needs 1892m^3 of space.

1. 21
2. 31
3. 18
4. 42

Q45. A solid wooden toy is in the form of a hemisphere surmounted by a cone of same radius. The radius of hemisphere is 3.5 cm and the total wOod used total wood used in the making of toy is $166\frac{5}{6}\text{cm}^3$ **5 Marks**

1. Find the diameter of hemishpere.

1. 3.5cm
2. 7cm
3. 10.5cm
4. 5cm

2. What is the total volume?

1. $\frac{1000}{6}\text{cm}^2$
2. $\frac{1011}{6}\text{cm}^2$
3. $\frac{1001}{6}\text{cm}^2$
4. None of these

3. Find the height of the toy.

1. 6cm
2. 7cm
3. 8cm
4. 9cm

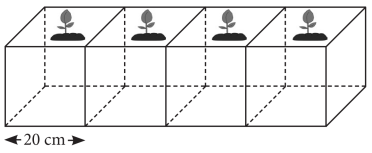
4. Find the CSA pf hemisphere.

1. 88cm^2
2. 77cm^2
3. 66cm^2
4. 55cm^2

5. Find the cost of painting the hemisphere part of the toy at the rate of Rs 10 per cm^2 .

1. Rs 550
2. Rs 660
3. Rs 440
4. None of these

Q46. Anjali join four cubical open boxes of edge 20cm each to make a pot for planting saplings of pudina in her kitchen garden. The saplings are cylindrical in shape with diameter 14.2cm and height 11cm. **5 Marks**



On the basis of above information, answer the following questions.

1. If Anjali wants to paint the outer surface of the pot, then how much area she needs to paint?

1. 6400cm^2
2. 5600cm^2
3. 4200cm^2
4. 2025cm^2

2. What is the volume of the pot formed?

1. 32000cm^3
2. 20250cm^3
3. 40000cm^3
4. 10125cm^3

3. If Anjali decorates the four walls of the pot with coloured square paper of side 10cm each, then how many pieces of papers would be required?

1. 120
2. 54

3. 160
4. 40

4. Find the volume of 1 sapling.

1. 1742.75cm^3
2. 4548.16cm^3
3. 1764.08cm^3
4. None of these.

5. If Anjali planted 4 saplings in the pot with some soil and compost up to the brim of the pot, then how much soil and compost are there in the pot?

1. 12612cm^3
2. 25029cm^3
3. 21975cm^3
4. None of these.